



## Answers

What are the two sides of a penny called? Heads and tails

If you flip a penny, what are the two ways the penny can land? Heads or tails

If you place 100 pennies in a cup, shake them up, and pour the pennies out of the cup, how many do you predict will come up heads? About half

What are the chances of the penny coming up heads? Fifty-fifty

If every time you do the process you remove the pennies that come up heads, how many times of repeating the process will it take before all of the pennies have come up heads and are removed? After one time 50 pennies, two times 25 pennies, three times 12.5 pennies, four times 6.25 pennies, five times 3.125 pennies, six times 1.5625 pennies, seven times .78 pennies, therefore the answer should be around seven times. So If every time I do the process and remove the pennies that come up heads, then it will take 7 times before all the pennies have come up heads are removed.

How many trials did it take for half of the pennies to have come up heads?  
one

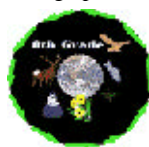
When half of the original 100 pennies had come up heads and there were approximately 50 pennies in the cup. When those pennies were dumped out. How many were left that came up heads? 25

The time it takes for half of pennies to have come up heads is called the half life. What is the half life of the pennies? 1 trial is the time it takes for half of the pennies to have changed.

Imagine that it took 1000 years for you to dump out the pennies. Change all the numbers on the graph to thousands. Then use the graph to answer the following questions.

If there is 40% remaining, how long did it take? Find 40% on the graph. On the graph go over from 40% to the curve. Go straight down to the bottom of the graph and read the number at that point. It should be about 800 years.

If there is 20% remaining, how long did it take? Find 20% on the graph. On the graph go over from 20% to the curve. Go straight down to the bottom of the graph and read the number at that point. It should be about 1500 years.



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